

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-13 (Cancelled)

14. (New) A quantum well structure for the absorption or emission of photons comprising a quantum well layer (7; 107; 207; 301) arranged between two barrier layers (9, 11; 109, 112; 209, 212; 303), wherein at least one of the barrier layers (9, 11; 109, 112; 209, 212; 303) comprises nanostructures (10; 110; 210; 310) which compensate or modulate a lateral homogeneity of the barrier layer (9; 109; 209; 303D), which is present without the nanostructures (10; 110; 210; 310), characterised in that the quantum well layer (7; 107; 207; 301) is in the form of an absorption or emission layer for the absorption or emission of the photons.

15. (New) A quantum well structure as set forth in claim 14 characterised in that the quantum well layer (7; 107; 207; 301) comprises an energy band with energy levels of differing energy, wherein the energy values of the energy levels are so adjusted that the absorption or emission of photons occurs with a given wavelength.

16. (New) A quantum well structure as set forth in claim 14 characterised in that self-organised three-dimensional structures (10; 110; 210; 310) are present as nanostructures.

17. (New) A quantum well structure as set forth in claim 16 characterised in that the self-organised three-dimensional structures (10; 110; 210; 310) are made from a material which has a markedly greater lattice constant than the material of the barrier layer (9; 109; 209; 303D).

18. (New) A quantum well structure as set forth in claim 16 characterised in that the self-organised three-dimensional nanostructures (10; 110; 210; 310) are in the form of quantum dots.

19. (New) A quantum well structure as set forth in claim 16 characterised in that the self-organised three-dimensional nanostructures (10; 110; 210; 310) are in the form of quantum wires.

20. (New) A quantum well structure as set forth in claim 14 characterised in that at least one of the barrier layers is in the form of an aluminum arsenide layer (9; 109; 303D) which includes indium arsenide islands (10; 110; 310) as nanostructures.

21. (New) A quantum well structure as set forth in claim 14 characterised in that at least one of the barrier layers is in the form of an indium phosphide layer (209) which includes indium arsenide islands (210) as nanostructures.

22. (New) A quantum well structure as set forth in claim 14 characterised in that it comprises at least two quantum well layers (7; 107; 207; 301) which are each separated from each other at least by a respective barrier layer (9, 11; 109, 112; 209, 212; 303).

23. (New) A quantum well structure as set forth in claim 14 characterised in that the nanostructures (10; 110; 210; 310) are of a dimension of less than 50 nm in at least one lateral direction in which they extend.

24. (New) A quantum well structure as set forth in claim 23 characterised in that the dimension is in the range of between 5 and 15 nm.

25. (New) A quantum well photodetector comprising at least one quantum well structure as set forth in claim 14.

26. (New) A quantum cascade laser comprising at least one quantum well structure as set forth in claim 14.